2002

Banking on Gambling: Banks and Lottery-Linked Deposit Accounts

Mauro F. Guillén
University of Pennsylvania

Adrian E. Tschoegl
University of Pennsylvania

Recommended Citation

Guillén, M. F., & Tschoegl, A. E. (2002). Banking on Gambling: Banks and Lottery-Linked Deposit Accounts. *Journal of Financial Services Research, 21* (3), 219-231. http://dx.doi.org/10.1023/A:1015081427038

Banking on Gambling: Banks and Lottery-Linked Deposit Accounts

Abstract
Deposit accounts that provide an interest return determined by a lottery have proved to be popular around the world. From the point of view of a bank, these products are especially successful among relatively low-income customers, or in markets in which many people are outside the banking system. Below, we describe numerous examples of such accounts, and analyze their economics.

Keywords
randomized return, lottery, behavioral finance

Disciplines
Finance and Financial Management

Wharton

Financial Institutions Center

Banking on Gambling: Banks and Lottery-Linked Deposit Accounts

by
Mauro F. Guillén
Adrian E. Tschoegl

00-25

The Wharton School
University of Pennsylvania

The Wharton Financial Institutions Center

The Wharton Financial Institutions Center provides a multi-disciplinary research approach to the problems and opportunities facing the financial services industry in its search for competitive excellence. The Center's research focuses on the issues related to managing risk at the firm level as well as ways to improve productivity and performance.

The Center fosters the development of a community of faculty, visiting scholars and Ph.D. candidates whose research interests complement and support the mission of the Center. The Center works closely with industry executives and practitioners to ensure that its research is informed by the operating realities and competitive demands facing industry participants as they pursue competitive excellence.

Copies of the working papers summarized here are available from the Center. If you would like to learn more about the Center or become a member of our research community, please let us know of your interest.

Anthony M. Santomero
Director

The Working Paper Series is made possible by a generous grant from the Alfred P. Sloan Foundation

BANKING ON GAMBLING: BANKS AND LOTTERY-LINKED DEPOSIT ACCOUNTS

Mauro F. Guillén
The Wharton School
University of Pennsylvania
Email: guillen@wharton.upenn.edu

Adrian E. Tschoegl*
The Wharton School
University of Pennsylvania
Email: tschoegl@alum.mit.edu

April 2000

* Corresponding author. We would like to thank Felix Oberholzer-Gee and Mark Zbaracki for helpful comments on an earlier draft and Witold Henisz for a helpful discussion. We would also like to thank Citibank whose generous grant to the Wharton School supported the research of which this is a by-product. In addition, numerous regulators and bankers gave generously of their time to answer questions. Lastly, C. Muñoz, A. Ripert, I. Corominas, and P. Freire provided able research and logistical support for the original project. Still, the analysis and opinions in this paper are ours.

BANKING ON GAMBLING: BANKS AND LOTTERY-LINKED DEPOSIT ACCOUNTS

Abstract

Lottery-linked deposit accounts have proved to be popular around the world. From the point of view of a bank, these products are especially successful among relatively low-income customers, or in markets in which many people are outside the banking system. Below, we describe numerous examples of such accounts, and analyze their economics.

1 Introduction

Banks continually search for new products to offer depositors. One product available in many countries around the world is the lottery-linked deposit account (LLDA). Their ubiquity is a testament to a popularity that transcends particular cultures and societies. The development of the Internet, and especially the development of Internet gambling, suggests that one can expect these accounts soon to be available in markets where they are not currently offered. This alone makes the LLDA a phenomenon worthy of further examination.

Governments and banks around the world have introduced savings instruments that automatically enroll the holder in a lottery. The basic structure of LLDAs is simple. Typically, the bank automatically enrolls in a lottery those depositors who maintain a deposit of some specified size for some specified period in the designated accounts. Commonly, the depositor receives one “lottery ticket” or chance, each month for every X dollars he has on deposit for that month. The buyer pays for her lottery tickets by foregoing interest relative to an account that does not have the lottery feature. The lottery does not affect the principal of the bond or deposit, but the interest rate that the holder receives each period is a random variable. The interest rate the holder actually receives

could be very low—perhaps zero or only nominal, depending on the scheme's structure—or it could be very high if the owner is lucky enough to win the grand prize.

The issuers' incentive to offer the accounts or bonds is that savers like the lottery feature and reward the issuers by accepting a lower return on the accounts than they would receive on an account that provided a certain return. That is, the account holders accept a bet that is unfair to them. Table 1 below gives some data from then Banco Bilbao Vizcaya (BBV) on the number and value of such accounts in its Latin American subsidiaries. The literature on gambling suggests that the payoff structure of the LLDAs should have certain characteristics — skewed returns and mechanisms to reduce holders' fatigue from the low likelihood of winning — and this is in fact what we observe.

Section 2 provides a number of examples from both the published literature and from the authors' own inquiries. Section 3 describes the accounts and discusses their economics. Section 4 discusses some public policy considerations. Lastly, Section 5 is the conclusion and a call for further research.

2 Lottery-linked bank accounts around the world

Lottery-linked bonds and bank accounts are not a new idea. We have identified a number of examples, of which the first set below involve bonds. The second set we describe involve bank accounts. The order of presentation is roughly historical.

UK and France: Weir (1989) and Weir and Velde (1992) report that in the 17th and 18th century, the governments of England and France issued various securities with what the authors call "externally randomized returns." Instead of paying a set rate of interest, the government periodically paid a premium to a subset of the holders of the securities—a

subset determined by lot on each occasion. The UK still has Premium Savings Bonds that pay 3.75% p.a. (from 1 March 2000), automatically enroll the holder in a monthly lottery with prizes ranging from £50 to £1,000,000, and are free of all UK Income Tax and Capital Gains Tax. The minimum investment per owner is £100, the maximum is £20,000, and the bonds are not transferable.

US: Jennings *et al.*, (1988) report that Alexander Hamilton proposed that the US introduce bonds with a randomized return. His objective was to find ways to fund the U.S. national debt. Calomiris (1991) suggests that the US government used such securities when issuing debt abroad in the 18th Century.

Sweden: Green and Rydqvist (1997) report that since 1918, the Swedish government has offered bonds that have coupon payments determined by lottery.

These bond market examples, except perhaps for the UK's premium bonds, may represent a targeting of a different clientele than that which state lotteries and LLDAs target. Smith and Villamil (1998) propose a model that suggests that governments would issue lottery-linked bonds to achieve an optimal sharing of the burden of large budget deficits in the face of private information about access to assets. They argue that their argument implies that one should not often observe explicit randomization in private contracts. However, as we show below, LLDAs are common form of private contracts with randomized returns.

LLDAs have appeared in a number of countries and all our examples are from the second half of the 20th century. LLDAs may have existed earlier; we just have not uncovered any examples in the economics literature. Both private and government-owned institutions have offered the accounts.

Japan: Minabe (1975) reports that the Japanese government offered LLDAs after World War II, probably in its postal savings system though he does not make this clear. LLDAs initially represented 82% of all time deposits and still represented 75% in 1962. By 1975, however, their popularity had apparently dwindled almost to nothing and the government ended the program.

However, in November 1994, the Jonan Shinkin Bank, a small cooperative bank in Tokyo introduced lottery-linked 1-year time deposits despite Ministry of Finance (MOF) disapproval. The MOF was unable to block the introduction as deregulation of banking had limited its powers. The National Association of Shinkin Banks had earlier that year formulated a rule against offering cash premiums to depositors and it condemned the bank for disobeying the rules. However, Jonan Shinkin attracted some Yen30 billion (US$305 million) into the bank in a matter of days (Hulme 1995). Thirteen other shinkin banks immediately took up the idea.

Turkey: Cosar (1999) mentions that Demirbank offered LLDAs in the 1950s.

Kenya: Since 1978 the Kenya Post Office Savings Bank has offered a Premium Bond Scheme based on bearer bonds in denominations of Ksh 10 (US$0.14) and Ksh 20. Apparently the scheme met with great customer enthusiasm and the bank is considering offering bonds with denominations of Ksh. 500 to Ksh 10,000 (Wright 1999).

Indonesia: In 1986, Bank Rakyat Indonesia (BRI) introduced the SIMPEDES program as a way of mobilizing deposits (Morduch 1999). BRI is a bank that specializes in microfinance lending to “better off” poor and non-poor households. While apparently quite successful on the loan side, the bank had less success in garnering deposits until it introduced the SIMPEDES accounts; these permit unlimited withdrawals and offer a

lottery. Interest rates range from zero to 1.25%/mo. for large (over US$100 equivalent) deposits, but even for large deposits are barely above the rate of inflation. Even so, between 1988 and December 1996, the number of depositors rose from over 4 million households to over 16 million. The average depositor appears less well off than the average borrower. Morduch (1999) reports that the accounts give BRI a relatively cheap source of funds for its lending while permitting households to build up their assets and smooth consumption.

Spain: Until the late 1980s, the banking sector in Spain was a cozy cartel. Starting in 1990, the competitive environment changed. Banco Santander, then Spain's second largest bank, set off a war for deposits among the large banks by offering interest on current accounts. (It did so in response to the initiatives of foreign banks' Spanish subsidiaries.) BBV, its chief rival, introduced its *el libretón*, an account that offered lower interest rates than Santander's *supercuenta*, but which enrolled their owners in a periodic lottery with prizes such as cars, trips, encyclopedias, and cash. Santander and other Spanish banks then introduced their own LLDAs. Later, when the Spanish banks entered retail banking in Latin America, they brought the idea of LLDAs with them.

Mexico: In August 1996, BBV Probursa, introduced the *libretón*, a move that Banco Santander México matched. BBV Probursa reports that its share of Mexican deposits grew from 2.5% in 1996 to 8% in 1997, due both to the LLDAs and other competitive moves. Locally-owned banks such as Banco Nacional de Mexico, Inverlat, and perhaps others also have since offered LLDAs.

Argentina: Banco Río, Banco Santander's subsidiary, introduced the accounts on a Monday in December 1997; BBV Banco Francés, followed that Friday. Banco Río's

lottery-linked accounts participate in a daily lottery for $20,000 and a monthly lottery for $222,000 (about 20X average per capita GDP of US$11K at PPP in 1998). Each US$200 on deposit gives the depositor one ticket in the lottery. The bank maintains a special phone number where customers can find out both the odds and the previous winning number. Also, a well-known radio station announces the winners each day at 12:15 pm. BBV Banco Francés' lottery offers cars, household appliances and other similar goods as prizes, as well as cash. Banco Francés offers one chance per $250 in deposits and a top prize each month of $250,000 (about 23X average per capita GDP). It announces its results on a popular evening TV program.

Both Banco Río and BBV Banco Francés report sharp increases of about 20% in their deposit and customer base within six months of the introduction of these products. Banco Francés reports that the accounts raised the bank's market share of Argentine deposits from 7% to 10% within 3 months. When the Spanish banks introduced the accounts the local banks disapproved. As of mid-1998, the local banks had not introduced similar accounts although some local executives report that they considered doing so. Still, the lack of response may have represented nothing more than a reaction lag.

Pakistan: In May 1998, Pakistan and India conducted nuclear tests. The US responded by imposing sanctions on both countries. The government of Pakistan, concerned about possible balance-of-payments consequences, froze foreign currency accounts and allowed withdrawals only in rupees. The result was a huge liquidity crunch as depositors withdrew their funds. The banks warned the government that if they could not use innovative schemes then the banks would not have the funds to lend to the

government, let alone industry. The government authorized the offering of LLDAs in July of 1998.

Habib Bank, government-owned and the largest bank in Pakistan, launched its *crore-patti* (multi-millionaire) in which the grand prize is R10 million (approx. US$217,000; about 130X average per capita GDP of US$1.7K at 1998/99 PPP). Muslim Commercial Bank, the fourth largest bank, launched its *maala-maal* account. At Bankers Equity term deposits of 3, 6 and 12 months carry interest rates of as much as 10% per annum (for the 12-month deposit) plus they qualify the depositor for participation in a monthly prize drawing. United Bank, also government-owned and Habib Bank's main rival, offers depositors who maintain a minimum deposit throughout the month a chance at a prize of a new car. It reportedly gained nearly Rs. 1.5 billion in deposits within two months. Other banks offer cash, motorcycles, televisions, computers and electronic gadgets.

The banks advertised the new accounts, which proved to be an instant success. Habib Bank reports that the accounts brought in some R10bn (US$217mn) in deposits between July and January 1999. The much smaller bank, Bankers Equity, reports that its lottery-linked deposit scheme drew R1bn in new accounts.

In May 1999, the Council on Islamic Ideology, the highest Islamic council in Pakistan, ruled that bank lottery schemes were un-Islamic. The Pakistani government announced that it would not challenge the ruling. On 23 December 1999, Pakistan's Supreme Court upheld a 1991 ruling by the Federal Shariat (Islamic Law) Court and ordered the Government to pass the necessary laws to phase in an interest-free banking and financial system by the year 2001.

The grounds for declaring the accounts un-Islamic were that the prizes are *de facto* interest. Many if not all interpretations of the *Koran* do not distinguish between interest and usury and take the prohibition on usury as forbidding interest (Aggarwal and Yousef 2000). The courts could have condemned the accounts on the grounds that the Koran also prohibits gambling or speculation but didn't.[1]

The State Bank of Pakistan has now ordered the banks to stop offering the products within Pakistan but permits them to offer them to non-residents remitting funds to Pakistan. However, the major sources of remittances are Pakistani residents of Saudi Arabia, the UAE and the UK. The Pakistani banks have no offices in Saudi Arabia and banks are prohibited from advertising such schemes in the UK in competition with the UK's premium bond scheme; as a result, the banks apparently are stopping altogether.

3 Lottery-linked bank deposit accounts

In the analysis of LLDAs below we will first discuss the accounts from the supply side, that is from the banks' point of view. Then we will turn to the demand side, that is to the depositors' point of view. For both we will first discuss issues of costs and then issues of benefits.

For the bank offering the LLDA, the monetary cost is deterministic, not random. It announces the payout in advance and unlike the situation with many state lotto games, all prizes are awarded and there is no rollover. The banks can explicitly index the number and value of the prizes to the number of qualifying accounts to maintain a target expected value. Equally, competition between banks should lead at least to implicit indexation.

[1] We would like to thank Mark Zbaracki for pointing out that the accounts combine three sins: usury,

Offering LLDAs is subject to economies of scale. The bank has to invest in the computer program to assign the chances or "tickets" to accounts, and to pick the winning ticket. It also has to advertise the accounts. These investments are a fixed cost that does not increase with the number of accounts the bank holds. There may also be another benefit to scale. Small banks cannot match the large banks in terms of the frequency and the richness of the prizes. Clotfelter and Cook (1990) point out that this matters to the demand for a lottery and has resulted in several small U.S. states banding together to offer joint lotteries. Although a small bank with its less frequent prizes may match a larger bank in terms of the (negative) expected value of its accounts, it may suffer from a marketing disadvantage. As Kahneman and Tversky (1973) have discovered, people often predict by representativeness and over-estimate the probability of rare, salient events. A ban that advertises winners more frequently than its competitors may benefit from such effects. Lastly, the larger bank can more readily increase the skewness of its payouts, an issue we will return to shortly.

Banks offering LLDAs have to know how to market the accounts. This involves not just advertising, but also the management of the prizes in terms of their structure and composition. The Spanish bankers with whom we spoke reported that periodically their banks would have to change the prizes to maintain customers' interest.

The banks offer the accounts to lower their cost of funds. When the lottery is not a "fair game" i.e., when the expected value of a ticket is less than the foregone interest, the bank gains. (Both regular deposit accounts and LLDAs require administration and we have no sense that the administrative costs are higher for LLDAs than for regular

---

gambling and greed.

accounts.) Discussions with executives at Banco Santander and BBV confirm that the LLDAs are a cheaper source of funds than regular savings accounts, even after one takes into account administrative costs and prizes.[2]

The bankers we spoke with believe that these products are especially successful with low-income depositors and in cases where there are lots of people outside the banking system. The Spanish banks believe, though no systematic studies exist, that the LLDAs enabled them to grow in those Latin American countries where they introduced the accounts by attracting new customers as well as stealing customers from other banks. The examples we cited in Section 2 above suggests that the LLDA are products that grow the size of the market in countries with low deposit-to-GDP ratios or with lots of people lacking an account. That is, the accounts draw in customers for whom savings plus a gamble has a higher utility than either holding savings in cash or consumer durables, or possibly immediate consumption. Unfortunately, we know neither the scale nor the source of any increase in measured savings.

The suppliers' benefit is the demanders' cost. If the banks are offering less than a fair bet, this means that holders of LLDAs must be receiving a negative expected return in monetary terms. (We will return to this issue below). Note, there is no issue of a foregone risk premium; finance theory has it that as the randomized returns on the LLDAs do not co-vary with the market (or priced factors), there is no need for a risk premium.

Paying for one's ticket by foregoing interest means that once one has opened the account, one does not have to do anything further; the participant does not have to reach

[2] We conducted interviews with bankers and regulators in Argentina, Chile, Mexico and Spain between May and July of 1998. Our interviews focused on the entry of the Spanish banks in Latin America. That led to the discussion of LLDAs.

into her purse each month to pay for her ticket for that month. The evidence in Kahneman and Teversky (1979) on individuals' asymmetric valuation of gains and losses suggests that this may be an attractive characteristic of the LLDAs.

Relative to government lotteries, the LLDAs have the disadvantage that depositors cannot choose the number on their ticket. As Farrell *et al*., (2000) show, this is an important feature as participants apparently value the opportunity to buy "lucky" numbers. Similarly, Clotfelter and Cook (1991) found that many players believe that they can improve their chances of winning by adjusting their bets to reflect recent winning numbers, or signs from dreams or events in their lives. However, conscious selection leads to bunching of bets, making tickets in government lotteries that permit the feature much harder to value than tickets in an LLDA.

The lotteries generally deliver a large number of small prizes and a small number of large prizes. The large prizes create skewness in returns. The frequent small prizes combat account holders' fatigue by reinforcing their continued interest despite the rarity of big wins. This payoff structure is also consistent with Quiggin's (1991) model, which takes as its starting point an assumption that bettors care about how their wealth compares to that of others (rank-dependent utility). Robson (1996) makes an argument that he bases on biological evolution for utility functions that have relative success as an argument of the function. In his model, those individuals who take fair bets will take fair bets that involve a high probability of small losses with a small probability of large gains. Similarly, Golec and Tamorkin (1998) find that bettors at the racetrack may value skewness, i.e., the possibility of a big win, rather than variance. Lastly, Brenner's (1986) analysis of Canadian data shows that the people who buy lottery tickets are likely to be persons who see the lottery

as offering them an opportunity of recovery after some form of sudden adversity has closed all other avenues to success.

Instead of relative rank, McCaffrey (1994) suggests that lottery buyers are seeking large sums because of indivisibilities in consumption. Obviously, cars, houses, TVs and so forth come in units. This argument requires both imperfections in credit markets leading to constraints on the ability to borrow, and low substitutability between goods that would undermine the discreteness of the consumption good. Thus a new car and a used car would have to be less substitutable than a demand for transportation alone would suggest. Interestingly, the LLDAs are consistent with the lump-sum argument. First, ROSCAS (rotating savings and credit associations) are also commonly to be found in poor countries (Morduch 1999). These provide lump sums through the deterministic mechanism of all participants contributing to the pot each month with each participant drawing the pot in turn until all have drawn. (Even so, the need to keep membership limited as part of the enforcement mechanism limits the size of the lump sum that ROSCAs can mobilize.) Second, as we have seen earlier, many LLDAs offer prizes that are consumer durables such as apartments, cars, TVs, and the like.

If depositors in LLDAs are buying skewness or large lump sums, this demand combined with a bounded top prize, leads one to expect that the usual LLDAs are likely to be an inferior good. That is, wealthier people will spend a lower proportion of their wealth on lottery-linked accounts than will poorer people (the income elasticity of demand is probably less than 1). This conjecture is consistent with evidence on lottery participation. Brown *et al.*, (1992) find that the poor commit a greater portion of their income to lotteries though the middle class provides the greatest total amount. Interestingly, they

found that education generally is the best predictor of the amount of an individual's propensity to play the lottery and correlates negatively with the propensity to play. The reason for the correlation is an open question: education may proxy for class (a non-monetary source of relative status), wealth, an improved understanding of probability, or socialization to values that de-emphasize relative wealth.

4.0 Regulatory issues

The standard analysis suggests that in the case of new consumer goods that the public eagerly accepts; the introduction of the new good creates new consumer surplus. This is the position that Brinner and Clotfelter (1975) take with respect to state lotteries. However this position has some limitations when there is the question of consumer protection from what some would consider a harmful product. Still, the evidence suggests that gamblers are able to detect differences in payout rates between types of games or different slot machines and respond to these differences (Eadington 1999). This should not be too surprising as the gamblers make many small bets with fast feedback; as Thaler (2000) argues, this is the environment most conducive to economic rationality in decision making. (Of course, the gamblers may simply be good at ranking different slot machines against each other while still over-estimating absolute payoff rate.) The evidence that gamblers are price sensitive suggests that for most gamblers the bets they undertake provide a utility that is worth a known monetary cost. Still, the issue of addiction and problem gambling remains a concern.

As Eadington (1999) points out, problem gambling is harmful, more or less by definition. However there are few studies that estimate the social costs and these studies

are fraught with conceptual difficulties. One problem is specifying and costing the base case against which to evaluate the introduction of LLDAs. Furthermore, some of the issues with casino gambling, the situation that Eadington describes, do not apply to LLDAs. With LLDAs there is no casino town or district drawing criminals and requiring additional policing. LLDAs also enforce a restraint in that the holder bets the interest not the principal of his savings, and that at a rate that the bank controls. Of course, LLDAs may still introduce some susceptible people to gambling who would otherwise not have begun.

Interestingly, Minabe (1975) reports that when the Ministry of Finance originally proposed LLDAs, the opposition criticized the idea. The opposition argued that LLDAs would incite "the gambling spirit of the people and would have a poor educational effect." In response, the MOF constructed the lottery so that depositors would get at least 3%/annum; furthermore, it ensured that the lottery would have an expected value of 3.75%, which was the statutory maximum interest rate payable on time deposits.

The authors had an opportunity to discus LLDAs with regulators in three Latin American countries: Argentina, Chile, and Mexico.[3] An issue that did come up in discussions with the Latin American regulators is the morality of gambling. However, this was not an explicit factor in any of the three cases, and in all three countries the government does sponsor lotteries.

The Chileans blocked the innovation when the Spanish banks proposed it. The reason is that the Banco Central de Chile (BCC) has a policy of requiring banks to push all costs into the interest rate. The BCC's position is that markets need to "get prices right." The

[3] We base our assessment of the stance of the regulatory authorities on our interviews with them.

argument is that if consumers cannot tell what their deposit are earning, they may not be able to make wise decisions as to where to put their money. The BCC particularly wished to prevent the occurrence of a situation where customers would open an account with a shaky bank because of its lottery while ignoring the risk that the bank would fail. (Of course, one could equally well worry that consumers might choose a bank on the basis of its hours or location rather than its riskiness.)

The Banco Central de la República Argentina (BCRA) did not like the idea of the LLDAs but it is not clear on what grounds rather than a general sense of disquiet. (Also, it was foreign banks that were introducing the accounts and the local banks were opposed due to an inability to compete.) However, the BCRA pointed out that Argentina is moving to a more market-oriented economy and away from heavy-handed regulation. The authorities therefore had no basis on which to intervene. Note however, that the accounts do not qualify for deposit insurance.

In Mexico, the regulatory authorities appear not to have given the issue any thought at all. The regulators we spoke with suggested that the banking system had such serious problems that the question of the authorization of LLDAs was a third-order concern. Unlike the situation in Argentina, the accounts qualify for deposit insurance.

As far as the US is concerned, our reading is that today, FDIC-insured state non-member banks may not participate in lotteries. The wording of the regulation does not directly address LLDAs, but does prohibit banks from participating in lotteries.

The only paper we have found that discusses the ethics of (state) lotteries (Stearns and Borna 1995) points out that the state lotteries the authors examined apparently engage

in ethically questionable advertising. Clotfelter and Cook (1991) also observed misleading advertising with respect to the issue of participants picking winning numbers and in other respects as well. Stearns and Borna (1995) argue that lotteries can be ethically acceptable provided the offerers do not engage in misleading advertising and participants have ready access to the information necessary to evaluate their chances of success. Interestingly, the Spanish banks in Argentina and Mexico include as part of their LLDA programs phone numbers that interested parties can call to determine the odds of winning. Given the evidence on gamblers' price elasticity of gambling, we can suspect that the banks' willingness to provide the information is driven as much by competition between banks as by any sense of ethics.

5.0 Conclusion

LLDAs are ubiquitous and one can expect that they will become even more available through Internet banking. Currently, access to the Internet probably correlates negatively with interest in such accounts as computer owners tend to be among society's better off. Still, this is changing. Furthermore, the accounts have proved popular in developing countries. As such, they merit further research. Useful directions include the following.

Does the introduction of LLDAs simply cannibalize existing savings or do the accounts generate new savings? We know that the accounts are popular but there are no studies that look at the effects on total savings.

Does the introduction of LLDAs cannibalize government-sponsored lotteries? As a first approximation one can expect that these private lotteries are closer to a fair bet than

are the state lotteries. They therefore are cheaper to the participant and so one can expect both substitution and an increase in the market for gambling.

Do LLDAs decrease or increase the harm from gambling to susceptible individuals? The harm from gambling comes from losing so bets that are closer to fair do less harm than do state-sponsored lotteries. However, any increase in the number of problem gamblers attributable to the introduction of LLDAs (the slippery slope argument) obviously reduces this benefit.

Regardless of one's opinion of gambling and the moral appropriateness of LLDAs as a product, LLDAs exist and are likely to become even more widespread. They therefore merit further investigation.

Bibliography

Aggarwal, R.K. and T. Yousel. 2000. Islamic Banks and Investment Financing. *Journal of Money, Credit and Banking* 32 (1): 93-120.

Brenner, G.A. 1986. Why Do People Gamble? Further Canadian Evidence. *Journal of Gambling Behavior* 2 (2): 121-129.

Brinner, R.E. and C.L. Clotfelter. 1975. An Economic Appraisal of State Lotteries. *National Tax Journal* 28: 395-404.

Brown, D.J., D.O. Kaldenberg, and B.A. Browne. 1992. Socio-Economic Status and Playing the Lotteries. *Social Science Research* 76 (3): 161-167.

Calomiris, C.W. 1991. The Motives of U.S. Debt-Management Policy, 1790-1880: Efficient discrimination and time consistency. *Research in Economic History* 13: 67-105.

Clotfelter, C. and P. Cook. 1990. On the economics of state lotteries. *Journal of Economic Perspectives* 4: 105-119.

Clotfelter, C. and P. Cook. 1991. Lotteries in the Real World. *Journal of Risk and Uncertainty* 4 (3): 227-232.

Cosar, N. 1999. Demirbank: The History of a Small Commercial Turkish Bank. *Business and Economic History* 28 (1): 125-132.

Eadington, W.R. 1999. The Economics of Casino Gambling. *Journal of Economic Perspectives* 13 (3): 173-192.

Farrell, L. 2000. The Demand for Lotto: The Role of Conscious Selection. *Journal of Business & Economic Statistics* 18 (2): 228-241.

Golec, J. and M. Tamorkin. 1998. Bettors Love Skewness Not Risk, at the Horse Track. *Journal of Political Economy* 106 (1): 205-225.

Green, R. C. and K. Rydqvist. 1997. The Valuation of Nonsystematic Risks and the Pricing of Swedish Lottery Bonds. *Review of Financial Studies* 10 (2): 447-80.

Guillén, M., and A.E. Tschoegl. 1998. The New Conquistadors: Spanish Banks and the Liberalization of Latin American Financial Markets. The Wharton School: case.

Hulme, D. 1995c. Bold Little Bank Shakes Up The Giants. Times Net Asia (accessed 4 April 2000. http://web3.asia1.com.sg/timesnet/fetpindx.html.

Jennings, R., D. Swanson, and A. Trout. 1988. Alexander Hamilton's tontine proposal. *William and Mary Quarterly* 45 (1): 107-115.

Kahneman, D. and Tversky, A. 1973. On the Psychology of Prediction. *Psychological Review* 80 (4); 237-251.

Kahneman, D. and Tversky A. Prospect Theory: An Analysis of Decisions under Risk. *Econometrica* 47 (2): 263-292.

McCaffery, 1994. Why people play lotteries and why it matters. *Wisconsin Law Review* 1: 71-122.

Minabe, S. 1975. A Time Deposit with Lottery Ticket. *Public Finance-Finances Publiques* 30 (2): 222-30.

Morduch, J. 1999. The Microfinance Promise. *Journal of Economic Literature* 37: 1569-1614.

Quiggin, J. 1991. On the Optimal Design of Lotteries. *Economica* 58 (229): 1-16.

Robson, A. J. 1996. The Evolution of Attitudes to Risk: Lottery Tickets and Relative Wealth. *Games and Economic Behavior* 14: 190-207.

Stearns, J.M. and S. Borna. 1995. The Ethics of Lottery Advertising: Issues and Evidence. *Journal of Business Ethics* 14: 43-51.

Smith, B.D., and A.P. Villamil. 1998. Government borrowing using bonds with randomly determined returns: Welfare improving randomization in the context of deficit finance. *Journal of Monetary Economics* 41: 351-370.

Thaler, R.H. 2000. From Homo Economicus to Homo Sapiens. Journal of Economic Perspectives 14 (1): 133-141.

Weir, D. 1989. Tontines, public finance, and revolution in France and England, 1688-1789. *Journal of Economic History* 49, 95-124.

—, and F. Velde. 1992. The financial market and government debt policy in France, 1759-1793. *Journal of Economic History* 52 (1): 1-39.

Wright, G.A.N. 1999. A Critical Review of Savings Services in Africa and Elsewhere. Center for MicroFinance, Kampala.

Table 1: Banco Bilbao Vizcaya's lottery-linked deposit account, *el Libreton*, is off to a strong start

Country	Launch date	No. of accounts (thousands)	Total volume (US$ millions)	Vol./Acct. (US$)
Mexico	Aug 96	485	178	367
Colombia	Jul 97	462	205	443
Venezuela	May 97	697	642	921
Argentina	Dec 97	78	232	2,949

Source: BBV internal document for Feb. 1998